

PATENT ABSTRACTS OF JAPAN

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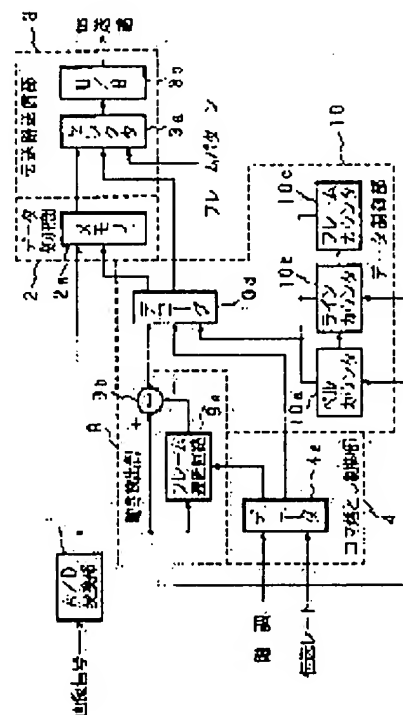
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(54) PICTURE COMPRESSION METHOD

(57)Abstract:

PURPOSE: To provide the picture compression method capable of natural reproduction to be used for the picture transfer in a video telephone, remote monitoring system or in a remote control system.

CONSTITUTION: The picture motion is detected by a motion detection part 9. On the other hand, the number of missing frames is decided by a missing frame control part 4. When the motion is more rapid than the prescribed reference and the number of missing frames is more than the prescribed value, the sub sample is taken as an add-numbered or even-numbered field, and taken as an add-numbered or even-numbered line in the case of a small number of missing frames.



LEGAL STATUS

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CLAIMS

[Claim(s)]

[Claim 1] It is the picture-compression approach characterized by to judge a motion of an image, to perform the subsample which uses odd-even one field as an effective data in the approach of carrying out a subsample and compressing it while carrying out coma dropping of the image of the multiple frame which constitutes one frame from the 2 fields of interlaced scanning when a motion is size from predetermined criteria, and there are coma dropping [many], and to perform the subsample which uses odd-even one Rhine as an effective data when there are coma dropping [few].

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the picture compression approach used on the occasion of the picture transmission in a TV phone, remote monitoring system, or remote control systems.

[0002]

[Description of the Prior Art] The picture transmission in the field of the invention like **** is giving priority to the formation of a low transmission rate, a miniaturization, and low-pricing over high fidelity. for this reason, coding in a frame, interframe coding, or DCT (Discrete Cosine Transform) etc. -- picture compression by the low bit rate coding method was not performed, but the method by data reduction of gradation reduction or a subsample, coma dropping is taken.

[0003] Drawing 1 is the sketch block diagram of the conventional sending set which used this kind of the picture compression approach. A picture signal is A/D. It is changed into a digital signal by the transducer 1, and is inputted into the data-processing section 2. On the other hand, the set point of gradation and a transmission rate is given to the coma dropping control section 4, and the coma dropping control section 4 determines the number of coma dropping by these input, and gives the corresponding control signal to the data-processing section 2 and the transmission-line transmitting section 3.

[0004] The data-processing section 2 defines the conditions of a subsample based on gradation, a transmission rate, and the number of coma dropping, reduces the data based on a subsample from the frame which incorporated the frame and was incorporated, i.e., an effective frame, at spacing which follows the number of coma dropping from the inputted digital picture signal, and outputs them to the transmission-line transmitting section 3. The transmission-line transmitting section 3 carries out multiplex [of the reduced picture signal and the information, such as the number of coma dropping concerning this reduction,], and transmits.

[0005] Drawing 2 shows the conventional receiving set, it is received in the transmission-line receive section 5, and is decrypted here, a transmission-line frame is detected, and it separates into the data of the image itself, and the data about image reduction, and the former is given to the data playback section 6, and the signal with which the transmission line has been sent gives the latter to the data playback control section 8. In the data playback control section 8, a control signal required for data playback is created from an input signal, and this control signal is given to the data playback section 6. The data playback section 6 interpolates the part reduced by coma dropping, the subsample, etc. according to this control signal, and carries out data playback. The reproduced digital image data is D/A. It is changed into an analog signal by the transducer 7, and is displayed on a display (not shown).

[0006] a picture signal -- one of them -- 525 it constitutes from Rhine -- having -- the 1-263rd the odd number field in Rhine, and the 264th - the 525th It is the signal of the interlaced-scanning method by the even number field in Rhine. A subsample is those with 2 methods, and 525. There are a method which chooses the odd number in Rhine or even lines, and a method which chooses odd number or the even number field.

[0007]

[Problem(s) to be Solved by the Invention] The image or A/D which should carry out compression transmission now Suppose that they were the 2 fields where the frame with which the circle location was incorporated, without being A, B--F, and the animation moved comparatively violently, and carrying out coma dropping includes locations A and B for every field as the input image to a transducer 1 showed drawing 3.

[0008] When a subsample is depended on the method which chooses odd number or even lines, the information which can pinpoint A location of the odd number field and B location of the even number field remains. The playback image transmitted since the frame which carried out coma dropping of the frame by carrying out periodic duty is interpolated while reproducing the odd number of the frame which compensated and incorporated Rhine which runs short in the data playback section, and the even number field becomes what goes and comes back to A and B location for every field like drawing 4, and this continues until the following incorporation frame is sent. Therefore, when there are coma dropping [few], it changes to the following image immediately and is not conspicuous, but it trembles and is visible when there are coma dropping [many].

[0009] On the other hand, when based on the subsample which chooses odd number or the even number field, the location of A (or B) continues between interpolation screens, and it moves to the location of the odd number or the even number field suddenly with the following taking-in frame. In this case, although the magnitude of a motion is conspicuous when there are coma dropping [many], it turns out clearly that it is carrying out coma dropping, and there is no unnatural sensibility. On the other hand, when there are coma dropping [few], there is fault which looks like the animation of the awkward motion. This invention is made in view of this situation, and when reproduced, it aims at offering the picture compression approach which does not become an unnatural way of being visible.

[0010]

[Means for Solving the Problem] While carrying out coma dropping of the picture compression approach concerning this invention, the image of the multiple frame which constitutes one frame from the 2 fields of interlaced scanning When a motion of an image is judged in the approach of carrying out a subsample and compressing and a motion is size from predetermined criteria, It is characterized by performing the subsample which uses odd-even one field as an effective data, when there are coma dropping [many], and performing the subsample which uses odd-even one Rhine as an effective data when there are coma dropping [few].

[0011]

[Function] When a motion is a large image, and there are coma dropping [many], if a subsample is performed by choosing odd number or even lines, shaking will appear [as shown in drawing 3,] as mentioned above, but when a subsample is performed by choosing odd number or the even number field, a motion serves as a large playback image and there is no unnatural feeling. Moreover, when there are coma dropping [few], if a subsample is performed by choosing odd number or the even number field, a playback image will become likely to have been awkward, but when it carries out by choosing odd number or even lines, it becomes the playback image of high resolution by smooth motion, and there is no unnatural feeling. In addition, when there are few motions, there is no difference in vision by any method about a subsample.

[0012]

[Example] The example at the time of applying this invention approach to picture transmission equipment below is explained based on a drawing. Drawing 5 shows a sending set and drawing 6 shows the receiving set, respectively. The picture signal of the analog for transmission is A/D. It is inputted into a transducer 1, and it is changed into a digital picture signal, and is stored in memory 2a of the data-processing section 2, and is inputted into the motion detecting element 9. A/D The Vertical Synchronizing signal included in the picture signal in the transducer 1 again is extracted, and it is line-counter 10b of the data control section 10 about this. It is pel counter 10a of the data control section 10 about the clock pulse which gives and aligns with a horizontal digitization period. It gives.

[0013] The data which direct gradation and a transmission rate create the data which are inputted into

decoder 4a of the coma dropping control section 4, and are equivalent to the number of coma dropping according to input data, and are decoder 10d of the data control section 10 about the data of this number of coma dropping. And it gives frame delay circuit 9a of the motion detecting element 9. The digitized picture signal is inputted into subtractor 9b of the motion detecting element 9, and frame delay circuit 9a. Based on the data from decoder 4a, only the frame for several coma dropping minutes delays the inputted picture signal, and frame delay circuit 9a gives a delay picture signal to subtractor 9b. If it does so, a subtractor 9b output will serve as information showing an inter-frame motion [inter-frame / , i.e., effective / taking-in]. This subtractor 9b output is given to decoder 10d.

[0014] Pel counter 10a If counting of the input clock is carried out and counting of one line is carried out, a carry signal will be emitted, and it is line-counter 10b about this. It is reset while giving. Line-counter 10b It is reset by the Vertical Synchronizing signal and counting of said carry signal is carried out. 525 if it ***** -- a carry signal -- frame counter 10c counting -- it outputs as an object. These counters 10a, 10b, and 10c An output is decoder 10d. It is inputted. decoder 10d Counters 10a, 10b, and 10c from -- an input, the input from the motion detecting element 9, and the input from the coma dropping control section 4 -- decoding -- a memory write control signal and a data-processing control signal -- generating -- the former -- the data-processing section 2 -- moreover, the latter is given to the transmission-line transmitting section 3.

[0015] A memory write control signal is a signal which enables the store of memory 2a to the timing corresponding to the frame, the field, and Rhine which should be incorporated. This signal incorporates a frame in the frame pitch equivalent to the number of coma dropping determined by the coma dropping control section 4, and writes the information which the motion detecting element 9 outputted further, and the data which **** to the subsample method which becomes settled in combination with the number of coma dropping in memory 2a.

[0016] That is, the data is written in in order to perform the subsample according the subsample by selection of odd number or the even number field to selection of Rhine of odd number or even number when there are coma dropping [more] than a predetermined value, and there are coma dropping [few] again than a predetermined value when a motion is larger than a predetermined value. When a motion is smaller than a predetermined value, it is based on one which was defined beforehand of subsample methods.

[0017] The data written in memory 2a are read one by one to timing other than the timing currently written in. The image data which the data-processing control signal was inputted into the selector of the transmission-line transmitting section 3, and was read from memory 2a is also inputted into selector 3a. Selector 3a is inputted into this. According to a transmission-line frame pattern, a data-processing control signal and memory 2a image data are multiplexed, and a transmission-frame pattern is constituted. And it encodes by U/B (imbalance / balance, or unipolar/bipolar) circuit 3b, and sends out to a transmission line.

[0018] It is inputted into the transmission-line receive section 5; and the data from a transmission line are the B/U (balance / imbalance, or bipolar one/unipolar). It is decrypted by circuit 5b and a transmission-line frame pattern is detected. And received data are separated by selector 5a, image data is inputted into memory 6a of the data playback section 6, and picture compression information, such as the number of coma dropping and a subsample method, is given to decoder 8a of the data playback control section 8.

[0019] Moreover, it is pel counter 8b of the data playback control section 8 at the reset signal which synchronous circuit 5c outputs by the transmission-line frame pattern, Line-counter 8c, Frame counter 8d is reset. The clock corresponding to the pixel display timing of the display which is not illustrated is inputted into pel counter 8b, and if counting of an one-line phase-splitting this is performed, a carry signal will be outputted and it will be reset. a carry signal -- line-counter 8c -- counting -- it inputs as an object -- having -- line counter 8c525 If counting is carried out, a carry signal will be outputted and it will be reset. a carry signal -- frame counter 8d -- counting -- it is inputted as an object. These counters [8b, 8c, and 8d] enumerated data are inputted into decoder 8a.

[0020] Based on these inputs, the read-out signal from memory 6a is created, and it gives to memory 6a,

and it gives to selector 6e, a horizontal and a Vertical Synchronizing signal are created [the selection signal of data is created,] further, and decoder 8a is D/A. It gives to adder 7b of a transducer 7.

[0021] The data read from memory 6a are selector 6e, Field memory 6d, The data of the field which interpolated the Rhine data which chose suitably the data which it was inputted into Rhine memory 6c, and were read from memory with the selection signal from decoder 8a, the data of Rhine memory 6c, and field memory 6d data, and carried out the selection output of the sent image, or were removed with the subsample, or were removed with the subsample are interpolated. thus, the selected picture signal -- selector 6g, or [outputting the data from selector 6e as it is selector 6g by being inputted into frame memory 6f] -- or the interpolation of a frame by which coma dropping was carried out -- it should carry out -- frame memory 6f data -- choosing -- D/A It outputs to a transducer 7.

[0022] D/A A transducer 7 is this input data D/A It changes into the picture signal of an analog by converter 7a, and gives adder 7b. Adder 7b outputs a horizontal and a Vertical Synchronizing signal to this picture signal in piles to a display.

[0023]

[Effect of the Invention] It can move, when based on this invention like ****, and the most legible image can be obtained by carrying out picture compression which performs the subsample which becomes settled with the number of coma dropping, and displeasure is not memorized in the image of the awkward motion like old, and an image with shaking. In addition, this invention can be used not only for pictorial communication but for image recording/playback. Moreover, it is also possible to use a horizontal subsample together.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the sketch block diagram of the conventional sending set.

[Drawing 2] It is the sketch block diagram of the conventional receiving set.

[Drawing 3] It is the explanatory view of an animation.

[Drawing 4] It is the explanatory view of a playback image.

[Drawing 5] It is the block diagram of the sending set by this invention approach.

[Drawing 6] It is the block diagram of the receiving set by this invention approach.

[Description of Notations]

2 Data-Processing Section

9 Motion Detecting Element

10 Data Control Section

[Translation done.]

* NOTICES *

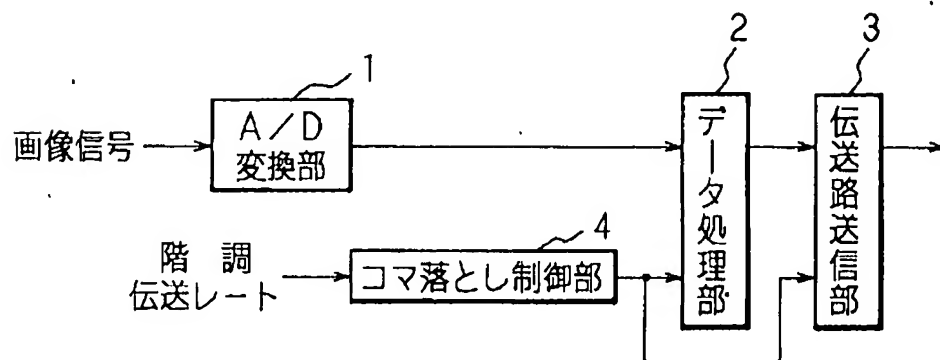
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DRAWINGS

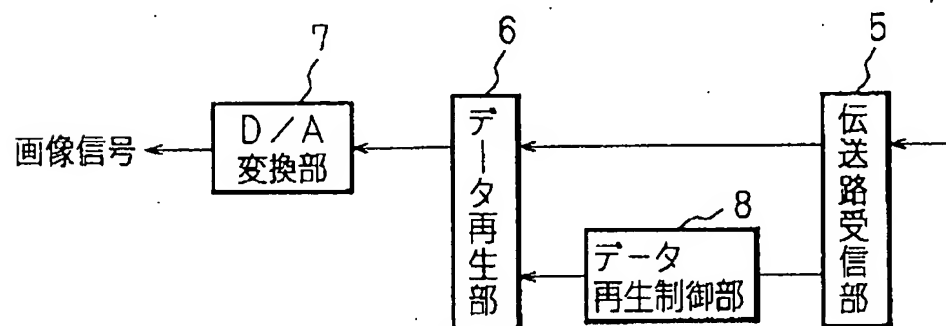
[Drawing 1]

従来の送信装置



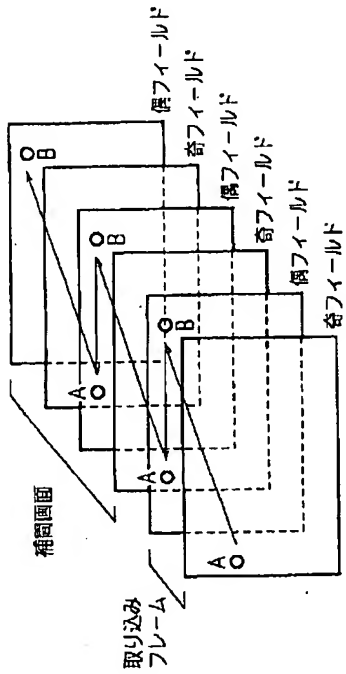
[Drawing 2]

従来の受信装置



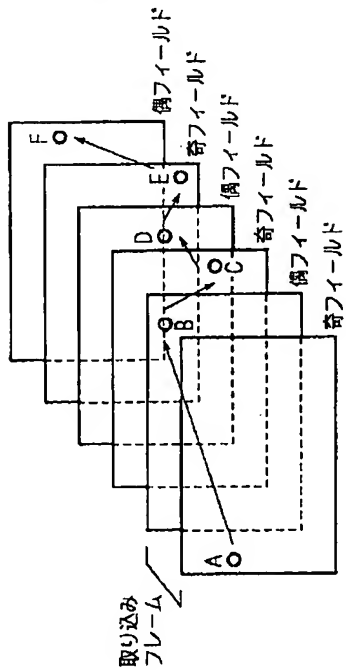
[Drawing 4]

再生画像説明図



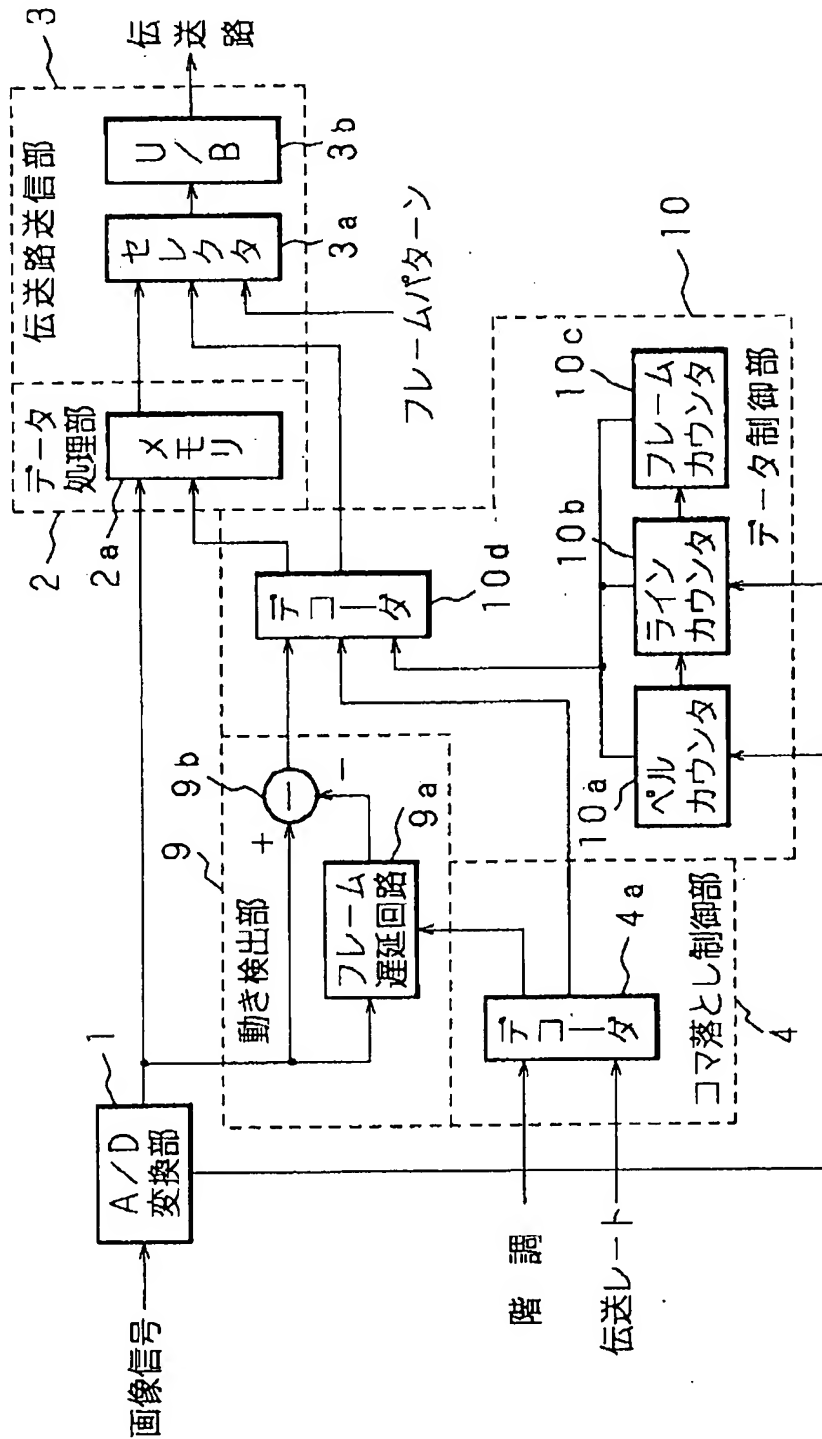
[Drawing 3]

動画説明図



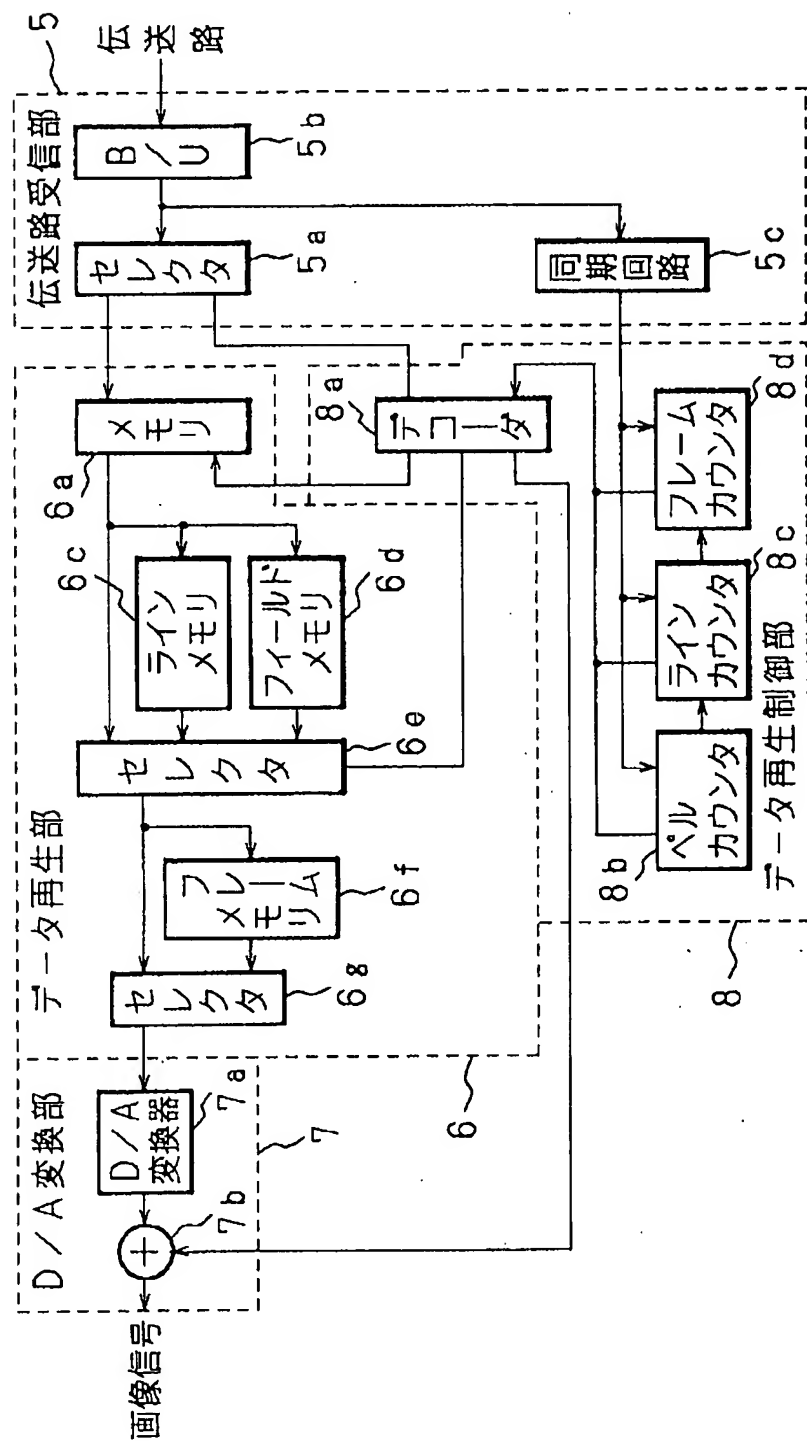
[Drawing 5]

本発明の送信装置のブロック図



[Drawing 6]

本発明の受信装置のブロック図



[Translation done.]